Proposed Plan

Wyckoff Soil and Groundwater Operable Units, Wyckoff/Eagle Harbor Superfund Site, Bainbridge Island, Washington

To provide your written comments, please write to:

Peter Rubenstein, Project Manager
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop ECL-115
Seattle, Washington 98101

For general questions, please call:

Nancy Wilson, Community Relations Coordinator
U.S. Environmental Protection Agency, Region 10
1-800-424-4372

EPA will be hosting a Public Meeting on the Proposed Plan
on December 3rd, 7:00 p.m., at the Bainbridge Island Commons.
Oral comments can be provided to EPA at the meeting.

Proposed Plan

Wyckoff Soil and Groundwater Operable Units,
Wyckoff/Eagle Harbor Superfund Site,
Bainbridge Island, Washington

Public Comment Period on Alternatives:
November 20 to December 20, 1997.

A Community Meeting is Scheduled for
December 3, 1997, from 7:00pm to 9:00pm

at **Bainbridge Island Commons,**
402 Bjune Drive,
Bainbridge Island, Washington.

The purpose of this proposed plan is to describe the U.S. Environmental Protection Agency's (EPA's) preferred alternative for dealing with contaminated soil and groundwater at the former Wyckoff wood-treating facility on Bainbridge Island, Washington, and to request your comments on the proposed actions.

Contents of This Proposed Plan

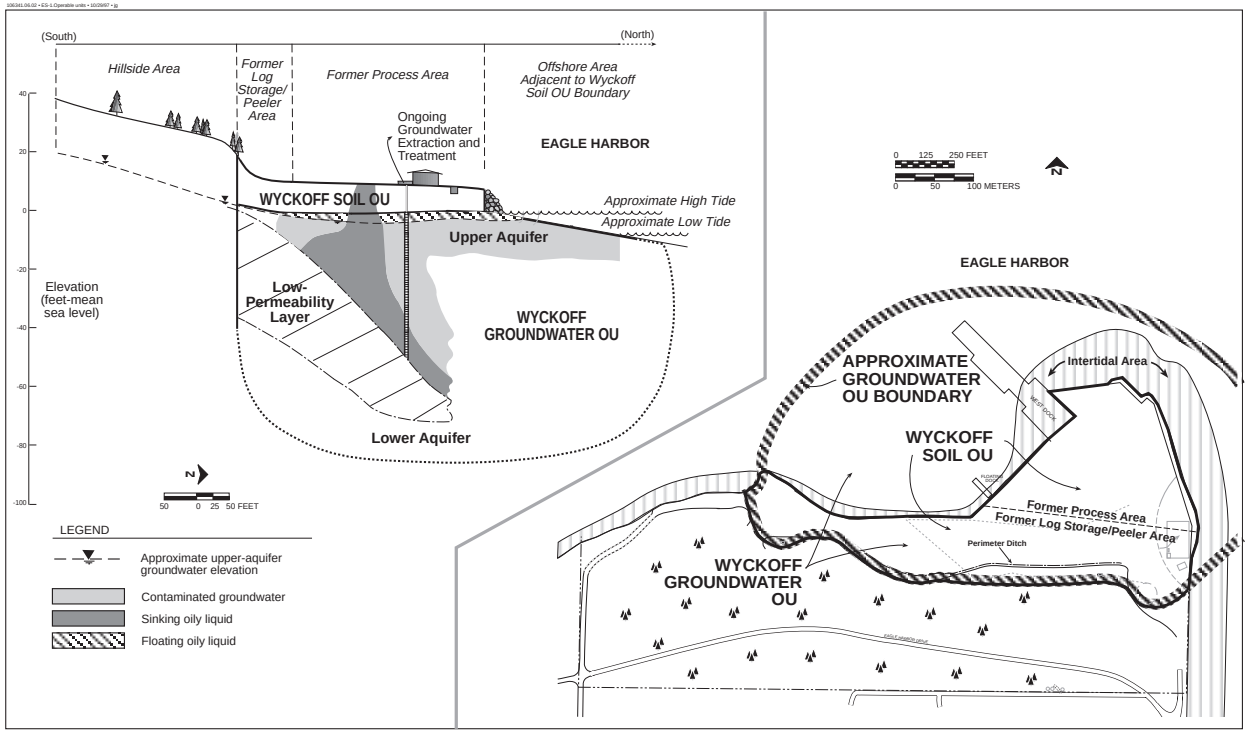
Summary

A remedial investigation and a feasibility study were completed at the Wyckoff property in 1997. This plan summarizes the information gained from these efforts and the alternatives that were developed for dealing with contaminated soil and groundwater at the property. EPA invites you to comment on its preferred alternative and the other alternatives summarized in this plan. **Your comments are requested by December 20, 1997.**

The preferred alternative includes the following elements:

- Cap contaminated soil in the "flat" area of the property.
- Excavate contaminated soil from a small area in the hillside portion of the property, and place it the flat area beneath the cap.
- Identify any additional hillside contamination.
- Use institutional controls to preclude the installation of drinking water wells in selected areas of the property and prevent activities that could damage or weaken the cap.
- Monitor groundwater in the future to confirm that contaminants will not cause risks and determine whether further action is needed.

The preferred alternative aims to improve conditions at the Wyckoff property so that future development can occur with a minimum of restrictions. The preferred alternative works in conjunction with remedial actions already being implemented at the property: these include replacement of the existing groundwater treatment plant, and construction of a barrier wall to prevent contaminants from migrating into Eagle Harbor.

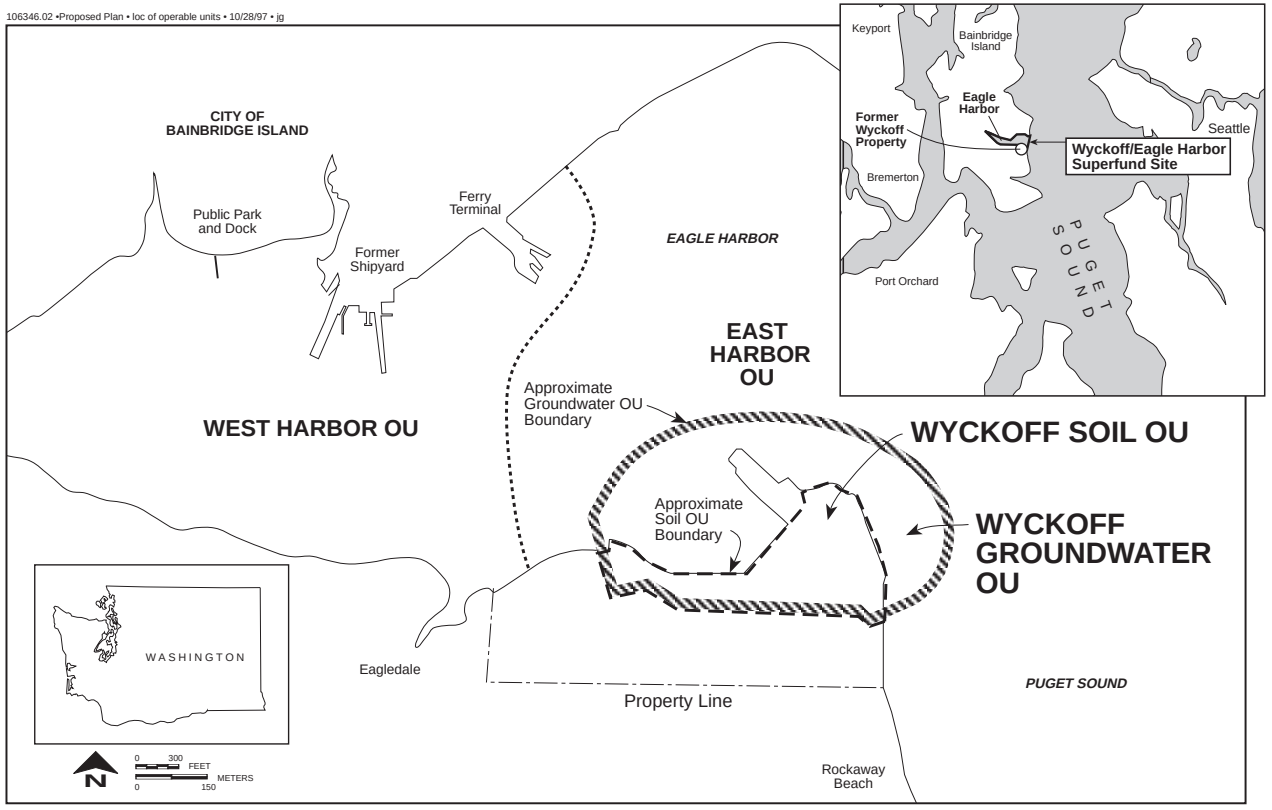


GENERALIZED OVERVIEW OF THE WYCKOFF PROPERTY AND THE SOIL AND GROUNDWATER OPERABLE UNITS

Introduction

The purpose of this proposed plan is to describe EPA's preferred alternative for dealing with contaminated soil and groundwater at the former Wyckoff wood-treating facility on Bainbridge Island, Washington, and to request public comment on the proposed actions and other alternatives.

The contaminated soil and groundwater at the Wyckoff property are referred to as the Soil and Groundwater Operable Units of the Wyckoff/Eagle Harbor Superfund Site. This site consists of four operable units (OUs), as shown in the figure to the right and as described in the table on the next page. Cleanup of the East and West Harbor OUs in Eagle Harbor is not included in this proposed plan.



LOCATIONS OF OPERABLE UNITS AT WYCKOFF/EAGLE HARBOR SUPERFUND SITE

Operable Units, Wyckoff/Eagle Harbor Superfund Site	
Operable Unit	**Description**
Wyckoff Soil OU *(part of this proposed plan)*	Unsaturated surface and subsurface soil located within the Wyckoff Soil OU boundary.
Wyckoff Groundwater OU *(part of this proposed plan)*	Saturated subsurface soil underlying the Soil OU, and groundwater underlying the Soil OU and extending towards Eagle Harbor.
West Harbor OU	Intertidal and subtidal surface sediments located within the West Harbor OU boundary.
East Harbor OU	Intertidal and subtidal surface sediments located within the East Harbor OU boundary.

EPA is the lead agency for the Wyckoff/Eagle Harbor Superfund Site. EPA works closely with the Washington State Department of Ecology, which is reviewing this proposed plan and evaluating EPA's preferred alternative.

This proposed plan was prepared in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is commonly known as Superfund. The CERCLA process requires the completion of the following tasks prior to the issuance of a proposed plan:

1. an investigation of the nature and extent of contamination at the site (known as a remedial investigation);
2. an estimate of the potential effects of this contamination on public health and the environment (known as a human health and ecological risk assessment); and
3. a study to evaluate alternatives to deal with the contamination (known as a feasibility study).

These steps have been completed for the Wyckoff property, and the findings provide the basis for this proposed plan. If you would like more information than is included in this plan, the reports documenting the activities listed above are available at the locations described in *For More Information* on page 22.

Community Participation and the Land Use Process

Community participation continues to be a critical element in developing ways to deal with the contamination at the Wyckoff/Eagle Harbor Superfund Site. EPA will consider your comments on this proposed plan when selecting the final remedial actions for the Wyckoff Soil and Groundwater Operable Units.

EPA believes that contamination at the Wyckoff property can be dealt with in a manner that will protect human health and the environment and allow for future development of the property. A citizen's committee, the Wyckoff Zoning Advisory Committee, has evaluated potential future use scenarios for the Wyckoff property and submitted a report to the City of Bainbridge Island's Planning Commission. In November 1997, the City Council will make a recommendation to EPA regarding the future uses that should be considered and how the property might be re-zoned to encourage these uses.

The City's planning process is separate from EPA's proposed plan. As part of its decisionmaking process, EPA is asking for input from the community and the City about the future use of the Wyckoff property; however, EPA is not involved in the specifics of zoning. If you have questions about the City's planning process, call Libby Hudson at the Planning Department (206-842-2552).

With regard to EPA's proposed plan, the public comment period provides you with the opportunity to review the plan and other documents, and to submit comments to EPA. EPA invites you to comment on the preferred alternative, on the other alternatives and information in the plan, and on the reports documenting studies of the Wyckoff Operable Units. Your comments will help EPA select an approach for dealing with the contamination at the Wyckoff Operable Units that is technically sound and addresses the community's concerns to the extent practicable.

The approach that EPA selects for the Wyckoff Operable Units will be identified early next year in the Final Record of Decision (ROD). (A Record of Decision is a formal, legal document that identifies the remedial action for a site and explains the reasons for its selection.) Please note that this will be the last ROD for the entire Wyckoff/Eagle Harbor Superfund Site.

EPA's written responses to all comments received on the proposed plan during the comment period will be provided in a Responsiveness Summary attached to the Final ROD. **To provide your comments, please write to this address by December 20, 1997:**

Peter Rubenstein, Project Manager
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop ECL-115
Seattle, Washington 98101

Background

History of the Wyckoff Property

From 1904 through 1988, a succession of companies treated wood at the property for use as railroad ties and trestles, telephone poles, pilings, docks, and piers. The wood-treating plant was one of largest in the United States, and its products were sold throughout the nation and the rest of the world.

Wood-treating operations included the use and storage of chemicals, solvents, gasoline, antifreeze, fuel and waste oil, and lubricants; management of process wastes; wastewater treatment and discharge; and storage of treated wood and wood products. The wood-preserving process used the organic preservatives creosote and pentachlorophenol. Creosote is a blend of various coal tar distillates that may contain up to 90 percent polynuclear aromatic hydrocarbons (PAHs) mixed with other hydrocarbons. Technical-grade pentachlorophenol contains 85 to 95 percent pentachlorophenol; the remainder is a mix of other chemicals and about 0.1 percent dioxins and furans.

From the early 1900s through the 1950s, the primary property owners were successively the following: the Perfection Pile and Preserving Company, the Pacific Creosoting Company, and the West Coast Wood Preserving Company. The Wyckoff Company assumed ownership of the property in 1964.

EPA began investigating the property in 1971. In July 1987 the site, including Eagle Harbor, was designated a Superfund site because of the contamination resulting from past operations. In 1988 the Wyckoff Company was directed by EPA to install groundwater extraction wells and a groundwater treatment plant in an effort to halt the continuing release of wood-treating contaminants to Eagle Harbor.

At the end of 1988, the Wyckoff Company ceased wood-treating operations while retaining ownership of the property under a new name, Pacific Sound Resources (PSR). Operation of the groundwater extraction wells and treatment plant continued. In November 1993, EPA assumed management of the Wyckoff Soil and Groundwater Operable Units for cleanup purposes. As a result of a settlement and a Consent Decree with the Wyckoff Company's heirs, in 1994 all of PSR's assets were placed into an environmental trust for the benefit of EPA's cleanup actions.

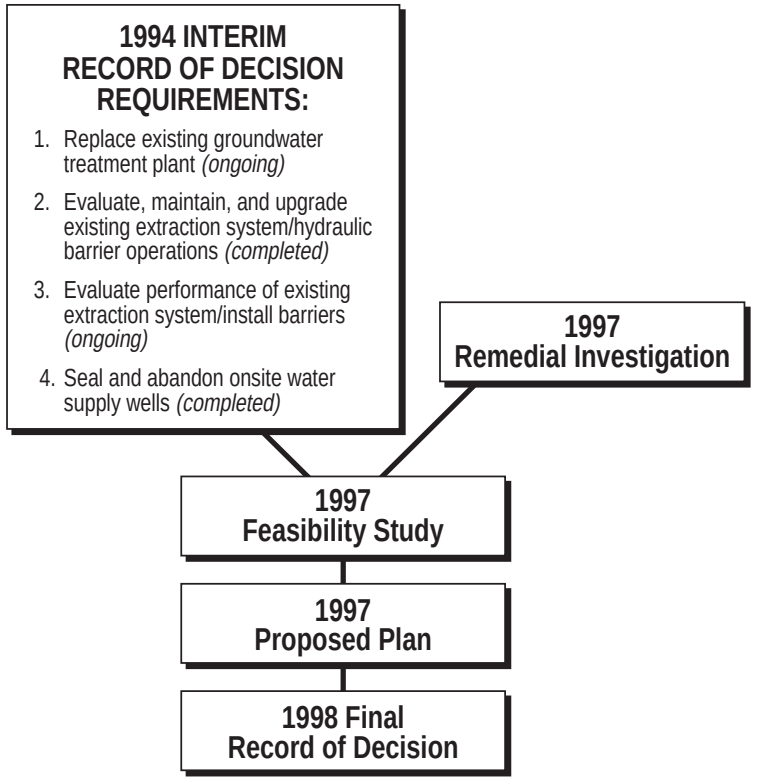
Actions already taken to deal with the contamination at the Wyckoff Operable Units include destruction and removal of the buildings, structures, and underground foundations and piping, and the removal of asbestos, sludge, and some heavily contaminated soil.

In addition, cleanup activities have been planned and implemented for the Groundwater Operable Unit under EPA's 1994 Interim ROD, as described on page 7.

EPA's Interim Record of Decision for the Groundwater Operable Unit

In September 1994, EPA issued an Interim ROD for the Wyckoff Groundwater Operable Unit specifying that four areas of activity be implemented. Two of these efforts have been completed, while two are still in progress. The figure to the right summarizes these activities and their status within the context of the final decisionmaking about the Wyckoff Operable Units. The estimated total cost of implementing these four groundwater-related activities over the next 30 years is approximately $57.2 million.

One of the activities still ongoing is the design and installation of a subsurface physical barrier to prevent contaminants from migrating into Eagle Harbor and Puget Sound from the former process area of the Wyckoff property. (This is part of requirement no. 3, as shown in the figure.) A slurry wall has been selected as the most appropriate kind of barrier, and is currently being designed. It is expected that a proposed alignment for this slurry wall will be defined by the spring of 1998, at which time the public will be invited to review and comment on this proposed alignment.



The other activity specified in the Interim ROD that is still ongoing pertains to the groundwater extraction and treatment systems at the Wyckoff property. Soon after EPA assumed control of the operation of these systems in 1993, it was discovered that they were in a state of disrepair. Eight new extraction wells were then installed to replace the original seven, and a variety of improvements were made to the treatment system. A replacement groundwater plant is currently being designed and is scheduled to be operational in 1999.

Subdivision of the Soil and Groundwater Operable Units

To focus investigation and cleanup efforts at this complex site, the Wyckoff Soil and Groundwater Operable Units have each been subdivided into three separate areas. This subdivision was based on both contaminant concentration levels and historical activities that took place in these areas. As illustrated in the figure to the right, the **Soil Operable Unit** is divided into the former log storage / peeler area, the former process area, and the well CW01 area.

The three components of the **Groundwater Operable Unit** are defined in the box below and illustrated conceptually in the figure to the lower right. Note that the actions implemented in accordance with the 1994 Interim ROD (described on page 7) affect the 1st component of the Groundwater Operable Unit. This proposed plan identifies remedial actions to deal with contaminants in the 2nd and 3rd components.

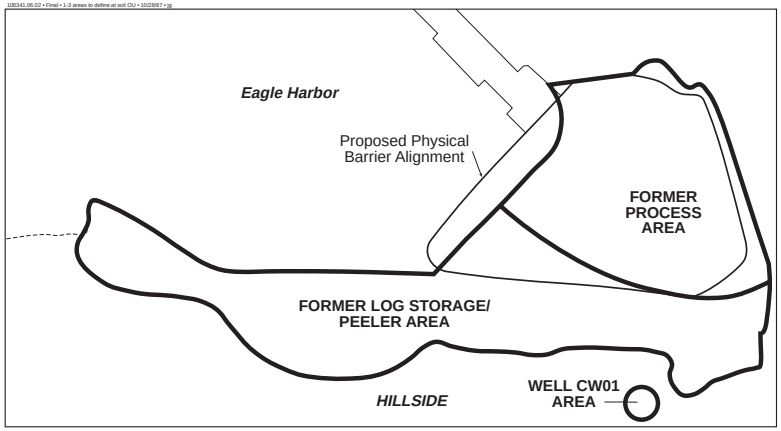
The Final ROD will specify the actions that have been selected for all of these components.

GROUNDWATER OPERABLE UNIT COMPONENTS

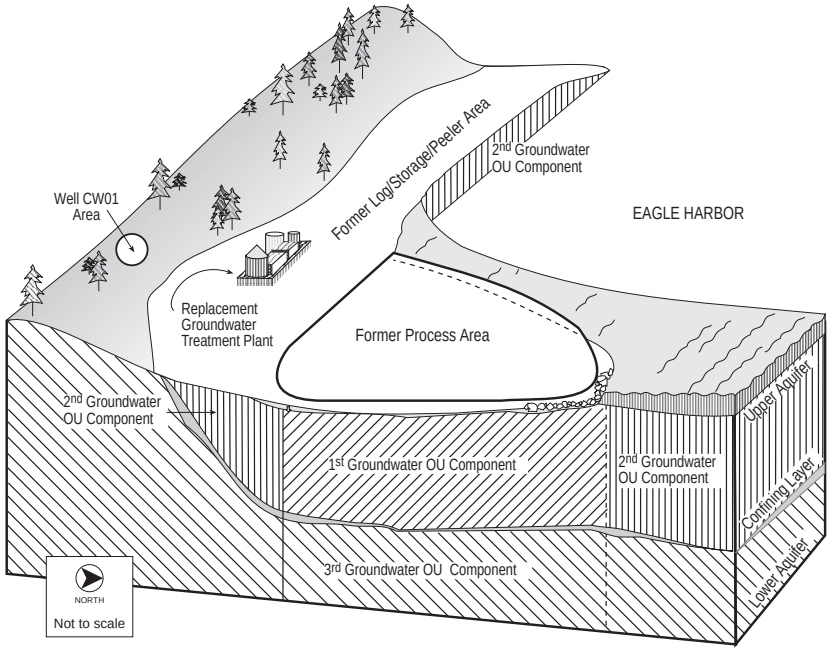
1st Groundwater OU component: *upper-aquifer groundwater underlying the former process area.*

2nd Groundwater OU component: *upper-aquifer groundwater underlying the Wyckoff property outside the former process area.*

3rd Groundwater OU component: *lower-aquifer groundwater underlying the former process area.*



THIS FIGURE IDENTIFIES AREAS AT THE WYCKOFF SOIL OPERABLE UNIT THAT WERE USED TO FOCUS INVESTIGATION AND CLEANUP EFFORTS.



THIS FIGURE SHOWS THE RELATIONSHIP BETWEEN THE UPPER AND LOWER AQUIFERS AND THE 1ST, 2ND, AND 3RD GROUNDWATER OPERABLE UNIT COMPONENTS

Investigation Findings

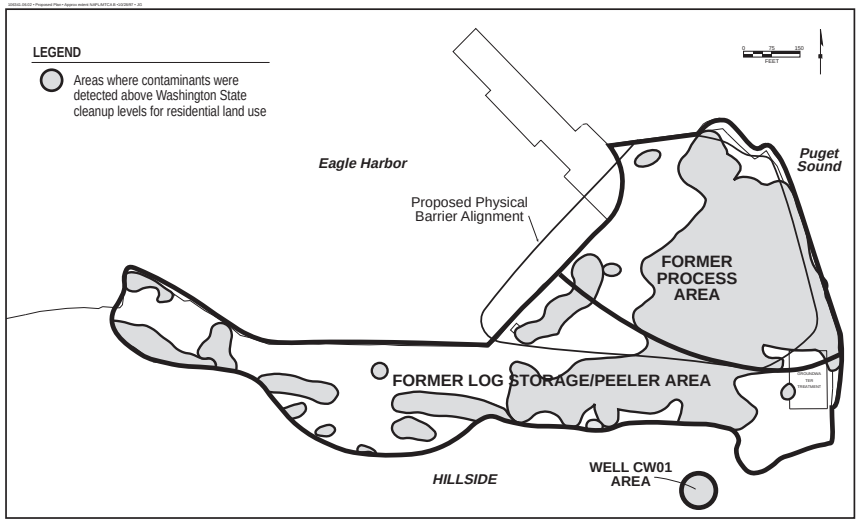
The findings of the remedial investigation and feasibility study completed in 1997 are summarized below.

Soil Contamination

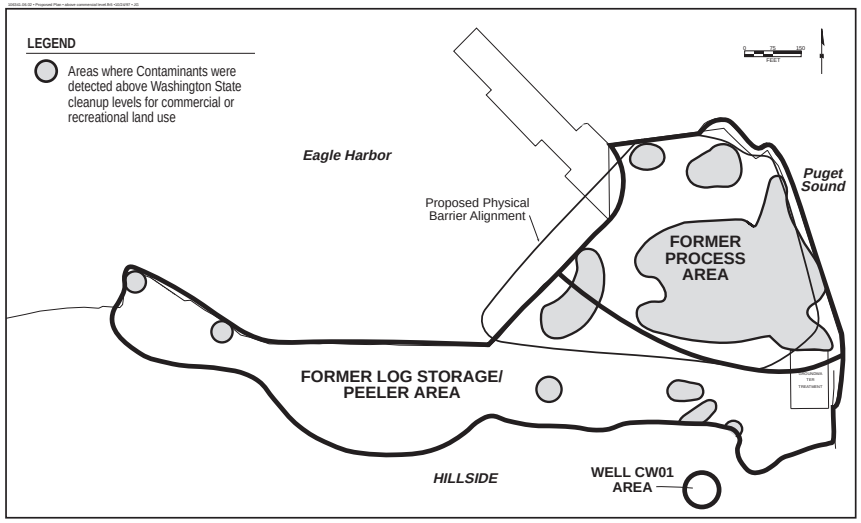
There is widespread near-surface and subsurface soil contamination at the Wyckoff property. The contaminants include PAHs, pentachlorophenol, and dioxins, which are present at concentrations that exceed Washington State cleanup levels for **residential land use**, as illustrated in the figure to the right. (This land use allows for future use with the minimum restrictions.)

The contaminants are also present at concentrations that exceed Washington State cleanup levels for **commercial or recreational land use,** as illustrated in the figure to the lower right. Washington State cleanup levels are contaminant concentrations established by the state; above these concentrations, the contaminants could pose risks to human health or the environment. At the Wyckoff property, approximately seven times as much soil exceeds cleanup levels for residential land use compared with the amount of soil exceeding cleanup levels for commercial or recreational land use.

EPA's preferred alternative for the Wyckoff Operable Units will control contaminants to cleanup levels acceptable for residential land use (i.e., the land use with the minimum restrictions).



SOIL AREAS AT THE WYCKOFF PROPERTY WHERE CONTAMINANTS WERE DETECTED ABOVE WASHINGTON STATE CLEANUP LEVELS FOR RESIDENTIAL LAND USE

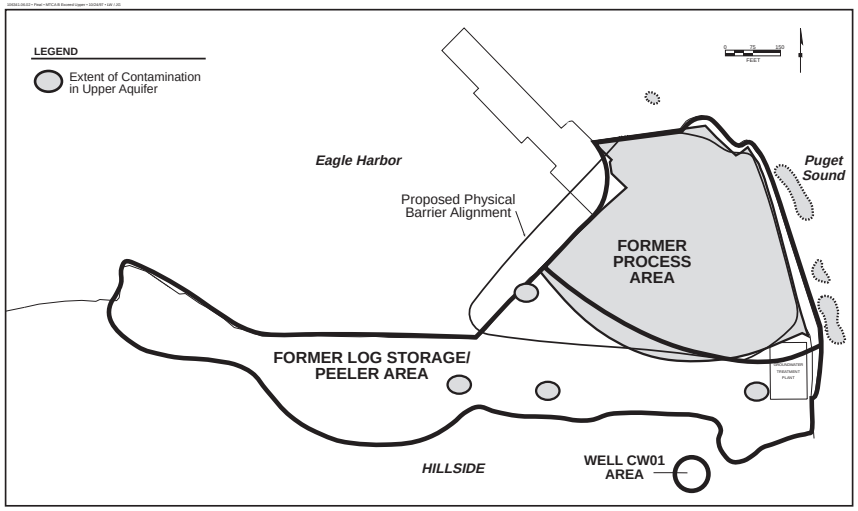


SOIL AREAS AT THE WYCKOFF PROPERTY WHERE CONTAMINANTS WERE DETECTED ABOVE WASHINGTON STATE CLEANUP LEVELS FOR COMMERCIAL OR RECREATIONAL LAND USE

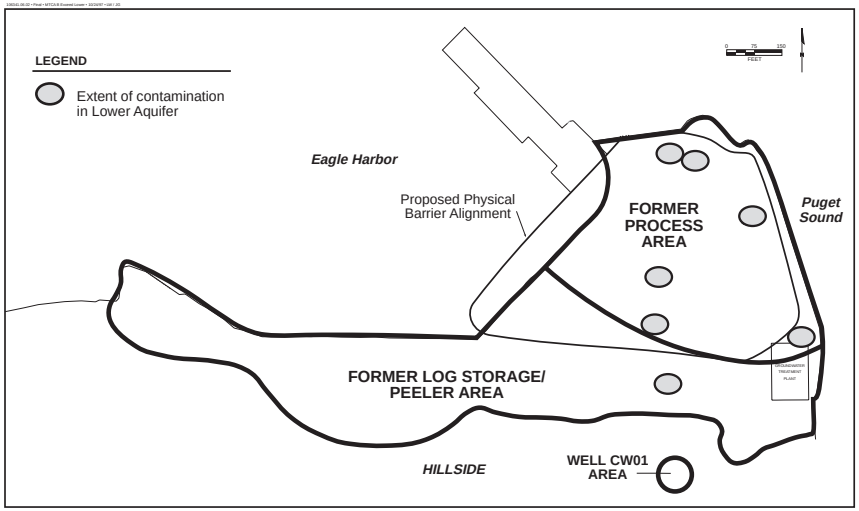
Groundwater Contamination

The **upper-aquifer groundwater** adjacent to and underlying the former process area (i.e., the 1st and 2nd Groundwater Operable Unit components) contains contaminants at levels that pose a significant potential risk to human health if ingested. In addition, continued movement of contaminants from the 1st component into Eagle Harbor poses a significant threat to both human health and the environment. To a lesser extent, the **lower-aquifer groundwater** underlying the former process area (i.e., the 3rd Groundwater Operable Unit component) contains contaminants at levels that pose a potential threat to human health if ingested. The contaminated areas are shown in the figures to the right.

If left alone, contaminated groundwater from the 1st Groundwater Operable Unit component will continue to move offsite into Eagle Harbor, threatening human health and the environment. In addition, the contaminated groundwater in both aquifers could potentially affect drinking water supplies for Bainbridge Island. Currently, groundwater beneath the property is not being used as drinking water. Remedial actions already being implemented (i.e., replacement of the groundwater treatment plant and design and construction of the barrier wall) are intended to prevent the contaminants from moving into Eagle Harbor. The other elements of EPA's preferred alternative will monitor contaminants to ensure that concentrations are safe for offsite drinking water use.



APPROXIMATE EXTENT OF OILY LIQUID AND CONTAMINATED GROUNDWATER IN THE UPPER-AQUIFER (THE 1st AND 2nd COMPONENTS OF THE GROUNDWATER OPERABLE UNIT)



APPROXIMATE EXTENT OF CONTAMINATED GROUNDWATER IN THE LOWER AQUIFER (THE 3rd COMPONENT OF THE GROUNDWATER OPERABLE UNIT)

Cleanup Alternatives and EPA's Preferred Alternative

The remedial investigation showed that contaminants are at unacceptable levels at the Wyckoff property, and that unacceptable risks would be posed to people or the environment if no actions were taken. As a result, a range of alternatives were developed and evaluated in the feasibility study. From these alternatives, EPA is proposing a combination of measures that represents its preferred alternative for the Wyckoff property.

The next four pages describe the alternatives that were evaluated to deal with contaminated soil and groundwater at the Wyckoff property. The alternatives for the Soil Operable Unit correspond to the three areas of the Wyckoff property that were defined previously: the former log storage / peeler area, the former process area, and the well CW01 area. For each of these areas, a preferred alternative was identified that EPA believes will achieve appropriate trade-offs in terms of the evaluation criteria discussed in *Evaluation of Alternatives* beginning on page 15.

Institutional controls will be implemented as part of EPA's preferred alternative. An example of institutional controls is restrictions on the construction of basements, in residences or other buildings, in order to prevent potential damage to a cap.

In general, the depth of soil that will be dealt with through EPA's preferred alternative will range between approximately 7 and 12 feet beneath the ground surface. In the case of the capping alternatives, no contaminated soil would be removed.

Characterization of the nature and extent of any additional soil contamination on the hillside at the Wyckoff property is also included in EPA's preferred alternative.

For the 2nd and 3rd components of the Groundwater Operable Unit, the alternatives under evaluation focused on future groundwater monitoring and the implementation of institutional controls (such as precluding the installation of drinking water wells in selected areas of the Wyckoff property).

This presentation of EPA's preferred alternative concludes with an overview of the final remedial actions for the 1st component of the Groundwater Operable Unit. These final actions, along with the preferred alternatives for each area of the Soil Operable Unit and the monitoring and institutional controls for the 2nd and 3rd components of the Groundwater Operable Unit, make up EPA's preferred alternative for the Wyckoff property as a whole.

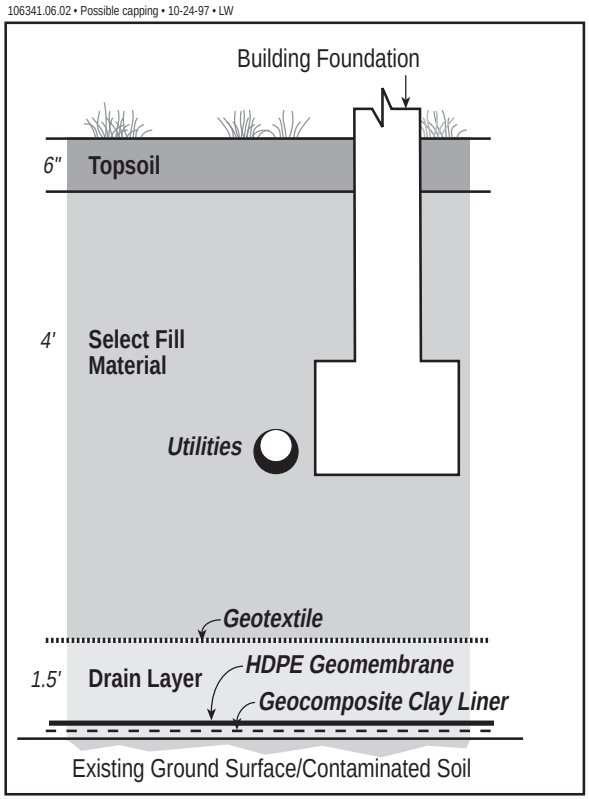
Former Log Storage/Peeler Area

The alternatives for the former log storage / peeler area are listed and described in the table to the lower left. EPA's preferred alternative, a cap, is Alternative F. An example is illustrated in the figure to the right.

Alternatives for the **Former Log Storage/Peeler Area**

Alternative*	**Description**
A: No Action	No actions are taken.
B: Removal, Offsite Disposal, Offsite Landfill	Contaminated soil is removed using heavy equipment and hauled to an offsite landfill.
C: Treatment, Thermal, Offsite Incineration	Contaminated soil is hauled to an offsite facility. Organic contaminants are then subjected to temperatures typically greater than 1,000°F in the presence of oxygen and a flame. Volatilization and combustion convert the organic contaminants to carbon dioxide, water, hydrogen chloride, and sulfur oxides.
D: Treatment, Physical/Chemical Onsite Dehalogenation	Contaminated soil is screened, processed with a crusher and a pug mill, and mixed with sodium bicarbonate. The mixture is heated to above 330°C (630°F) in a rotary reactor to decompose and partially volatilize the contaminants.
E: Removal, Onsite Consolidation	Contaminated soil is removed using heavy equipment and placed at another location on the Wyckoff property.
F: Containment, Capping *(EPA's Preferred Alternative)*	Several capping systems are possible; one that is representative is a multi-layer cover system. This generally consists of an upper vegetative layer (e.g., topsoil), underlain by a drainage layer (e.g., sand) over a low-permeability barrier layer – either low-permeability soil (e.g., bentonite-amended soil) or a geosynthetic (e.g., a geomembrane and/or a geocomposite clay liner).

** Refer to the last page of this plan for a table cross-referencing the alternatives above with those evaluated in the feasibility study.*



THIS FIGURE SHOWS THE CONFIGURATION OF A POSSIBLE CAPPING DESIGN THAT COULD BE IMPLEMENTED AS PART OF THE PREFERRED ALTERNATIVE

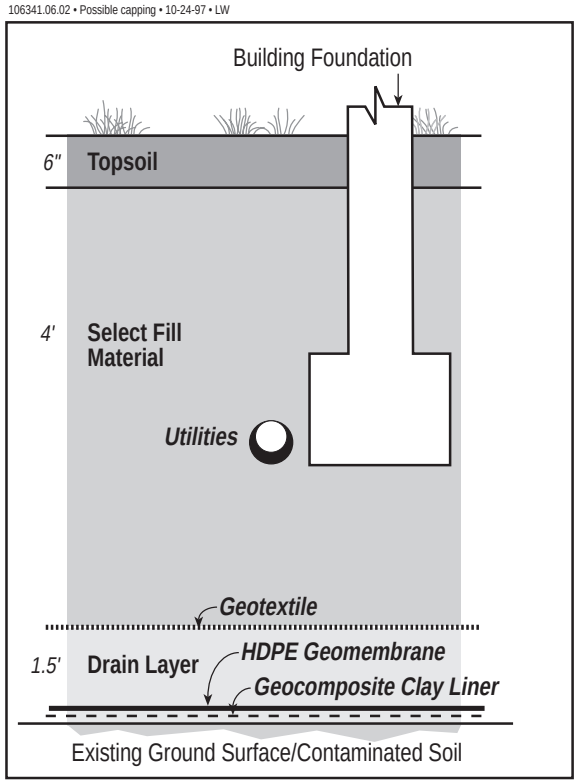
Former Process Area

The alternatives for the former process area are listed and described in the table below.
EPA's preferred alternative, a cap, is Alternative E.
An example is shown in the figure to the right.

Alternatives for the **Former Process Area**

Alternative*	Description
A: No Action	No actions are taken.
B: Removal & Treatment, Offsite Disposal & Thermal, Offsite Landfill with Incineration of 25% of Soil Volume	Contaminated soil is removed using heavy equipment and hauled to an offsite landfill. 25 percent of the soil is hauled to an offsite facility. Organic contaminants are then subjected to temperatures typically greater than 1,000°F in the presence of oxygen and a flame. Volatilization and combustion convert the organic contaminants to carbon dioxide, water, hydrogen chloride, and sulfur oxides.
C: Treatment, Thermal, Offsite Incineration	Contaminated soil is hauled to an offsite facility. Organic contaminants are then subjected to temperatures typically greater than 1,000°F in the presence of oxygen and a flame. Volatilization and combustion convert the organic contaminants to carbon dioxide, water, hydrogen chloride, and sulfur oxides.
D: Treatment, Physical/Chemical, Onsite Dehalogenation	Contaminated soil is screened, processed with a crusher and pug mill, and mixed with sodium bicarbonate. The mixture is heated to above 330°C (630°F) in a rotary reactor to decompose and partially volatilize the contaminants.
E: Containment, Capping *(EPA's Preferred Alternative)*	Several capping systems are possible; one that is representative is a multi-layer cover system. This generally consists of an upper vegetative layer (e.g., topsoil), underlain by a drainage layer (e.g., sand) over a low-permeability barrier layer – either low-permeability soil (e.g., bentonite-amended soil) or a geosynthetic (e.g., a geomembrane and/or a geocomposite clay liner).

** Refer to the last page of this plan for a table cross-referencing the alternatives above with those evaluated in the feasibility study.*



THIS FIGURE SHOWS THE CONFIGURATION OF A POSSIBLE CAPPING DESIGN THAT COULD BE IMPLEMENTED AS PART OF THE PREFERRED ALTERNATIVE

Well CW01 Area

The alternatives for the well CW01 area are listed below. EPA's preferred alternative, shown as Alternative E, is to remove contaminated soil from the area (on the hillside in the southern portion of the property) and place it in the flat area of the property, beneath the cap constructed in the former process area.

Alternatives for the **Well CW01 Area**

Alternative*	Description
A: No Action	No action is taken.
B: Removal, Offsite Disposal, Offsite Landfill	Contaminated soil is removed using heavy equipment and hauled to an offsite landfill.
C: Treatment, Thermal, Offsite Incineration	Contaminated soil is hauled to an offsite facility. Organic contaminants are then subjected to temperatures typically greater than 1,000°F in the presence of oxygen and a flame. Volatilization and combustion convert the organic contaminants to carbon dioxide, water, hydrogen chloride, and sulfur oxides.
D: Treatment, Physical/Chemical, Onsite Dehalogenation	Contaminated soil is screened, processed with a crusher and pug mill, and mixed with sodium bicarbonate. The mixture is heated to above 330°C (630°F) in a rotary reactor to decompose and partially volatilize the contaminants.
E: Removal, Onsite Consolidation *(EPA's Preferred Alternative)*	Contaminated soil is removed using heavy equipment from one location and placed in the former process area where it will be capped.

** Refer to the last page of this plan for a table cross-referencing the alternatives above with those evaluated in the feasibility study.*

Hillside Soil Characterization

An investigation will evaluate whether there is soil contamination on the hillside through the collection and analysis of soil samples and data evaluation and reporting. If contamination is found, EPA expects to use the same remedy that was used for the well CW01 area.

Monitoring of 2nd and 3rd Groundwater OU Components

To help monitor the effectiveness of the "pump-and-treat" remedial action already being implemented for the 1st component of the Groundwater Operable Unit (i.e., groundwater underlying the former process area), monitoring of upper-aquifer groundwater outside the former process area (the 2nd component) and lower-aquifer groundwater underlying the former process area (the 3rd component) will be conducted on a regular basis and will include establishing and maintaining a monitoring well network; sampling and analysis of groundwater; data evaluation; and data reporting.

Final Actions for the 1st Groundwater OU Component

The remedial actions specified in EPA's Interim ROD will be completed, including the replacement groundwater treatment plant and the slurry wall. Next spring, the public will have the opportunity to comment on the proposed alignment of the wall. EPA is also evaluating new technologies for groundwater cleanup, including steam sparging. If the new technology proves effective, EPA will implement it after public notification.

Evaluation of Alternatives

In accordance with CERCLA, the alternatives described on pages 12, 13, and 14 were evaluated using the nine criteria listed in the sidebar to the right.

The first two criteria are categorized as threshold criteria because an alternative must meet them in order to be selected. The No Action Alternative for all areas (Alternative A) fails to meet either of these criteria. All of the other alternatives do provide for overall protection of human health and the environment and are expected to meet the applicable or relevant and appropriate requirements.

Criteria 3 through 7 represent the primary factors upon which the evaluation is based.

The final two criteria will be evaluated following comment on the proposed plan and will be addressed while the Final ROD is being prepared. EPA's written responses to all comments received on the proposed plan during the comment period will be provided in a Responsiveness Summary attached to the Final ROD. EPA may modify its recommendations based on the final two criteria, following public comment.

Evaluation Criteria for Alternatives

Threshold Criteria — these criteria must be met by the alternative selected for the site.

1. **Overall Protection of Human Health and the Environment** addresses whether or not adequate protection of health and the environment is provided during and after construction (or cleanup).
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether or not the alternative would meet requirements of federal and state laws and regulations that apply or that are relevant and appropriate to the actions.

Balancing Criteria — these criteria are the primary factors that are taken into account when comparing the alternatives and selecting the preferred alternative.

3. **Long-Term Effectiveness and Permanence** refers to the ability of the alternative to reliably protect human health and the environment over time once the cleanup actions have been implemented.
4. **Reduction of Toxicity, Mobility, or Volume through Treatment** addresses the expected performance of treatment technologies that may be used and whether treatment is a main element of the proposed actions.
5. **Short-Term Effectiveness** evaluates the potential to adversely affect human health and the environment during the time when cleanup actions are taking place, and how quickly the alternative achieves protection of human health and the environment
6. **Implementability** refers to the technical and administrative difficulties associated with carrying out the alternative, including the availability of special materials or services, the coordination with other regulatory agencies, and how hard it would be to construct and operate the alternative at this site.
7. **Cost** is an estimate of the construction costs and the operating and maintenance (O&M) costs of the alternative.

Modifying Criteria — these criteria involve consideration of state and public concerns that may modify the alternative selected for the site.

8. **State and Tribal Acceptance** refers to whether the alternative adequately addresses the concerns of the state (represented in this case by the Washington State Department of Ecology) and Native American tribes (in this case the Suquamish Tribe).
9. **Community Acceptance** pertains to whether the alternative adequately addresses the concerns of the local community.

The alternatives for **the former log storage/peeler area** were compared with each other as shown to the right. EPA's preferred alternative, a cap, is shown as Alternative F.

The preferred alternative is protective for future residential land use and imposes the minimum restrictions; the cap breaks the ingestion exposure pathway to human and environmental receptors. The preferred alternative does not require any pre-design contaminant characterization or verification soil sampling activities to ensure that no "hot spots" of contamination (including dioxins) will be missed.

Although Alternative E (the removal and consolidation alternative) is less expensive, it would add height to the former process area. This would result in increased construction costs for the replacement groundwater treatment plant and extraction system.

Some land use restrictions would apply under the preferred alternative in order to prevent activities that could weaken or damage the cap.

Comparison of Remedial Alternatives for the Former Log Storage/Peeler Area

A	B	C	D	E	F	BALANCING CRITERIA *(alternatives are ranked by comparing them to each other)*
⇩	◗	◗	◗	◗	●	**Long-Term Effectiveness and Permanence** The alternatives are ranked according to their levels of long-term effectiveness and permanence. Alt. F would provide the highest level of effectiveness and permanence unless the cover was damaged. Alts. B, C, D, and E have a lower rating because future re-contamination of clean fill material is possible. Alt. A would provide no long-term effectiveness or permanence.
⇩ 0	◗ 0	● 0.1 to 0.5	● 0.1 to 0.5	◗ 0	❍ 0	**Reduction of Toxicity, Mobility, and Volume** ***(Numbers given as a percentage of total contaminant mass destroyed. The total mass is taken as the sum of the contaminant mass in the Soil OU.)*** The alternatives are ranked according to their reduction of these three factors. Alts. C and D would provide the greatest reduction because volume and mobility would be reduced and contaminants would be destroyed. Alts. B and E are rated lower, with a high level of reduction of mobility but no contaminant destruction. Alt.. F would reduce mobility but not toxicity or volume. Alt. A would provide no reduction.
⇩	◗	◗	❍	◗	●	**Short-Term Effectiveness** The alternatives are ranked according to their short-term effectiveness. Alts. B, C, D, E, and F would provide immediate effectiveness upon completion of construction. Alt. F is rated highest, with short construction time and little disturbance of contaminated soil. Onsite activities for Alts. B, C, and E would require removal only and have a higher short-term effectiveness than Alt. D, which would additionally require onsite treatment. Alt. A would achieve no short-term effectiveness.
●	◗	◗	❍	◗	●	**Implementability** The alternatives are ranked according to their ease of implementability. Alt. A would be the least difficult to implement, and Alt. F would be in the same range. Alts. B and C would be more difficult to implement, requiring removal of the contaminated soils, offsite transport, and monitoring. Alt. E would be similar, with onsite placement, monitoring, and O&M required. Alt. D would be the most difficult alternatives to implement, requiring setup of an onsite treatment system, handling of by-product wastes, monitoring, and O&M.
● $0	❍ to ⇩ $7.8 to $55.3	⇩ $27.2 to $194.0	❍ to ⇩ $4.9 to $28.7	◗ $0.6 to $3.4	◗ $4.4	**Cost** The estimated total present worth cost for each alternative is shown (in $millions) and includes capital and O&M costs.

KEY
- ● = excellent
- ◗ = good
- ❍ = fair
- ⇩ = poor

REMEDIAL ALTERNATIVES
- **ALT. A: No Action**
- **ALT. B: Removal, Offsite Disposal, Offsite Landfill**
- **ALT. C: Treatment, Thermal, Offsite Incineration**
- **ALT. D: Treatment, Physical/Chemical Onsite Dehalogenation**
- **ALT. E: Removal, Onsite Consolidation, Onsite Placement**
- **ALT. F: Containment, Capping, Multi-layer Cover System with Low-Permeability Barrier Layer**

The alternatives for **the former process area** were compared with each other as shown to the right.

EPA's preferred alternative, a cap, is shown as Alternative E.

As with the preferred alternative for the former log storage / peeler area (with which it is efficiently integrated), the preferred alternative for the former process area is protective for future commercial or recreational land use and imposes the minimum restrictions. The cap breaks the exposure pathway to human and environmental receptors and is cost-effective. Because the cap results in a relatively flat surface for the two combined areas, it also maximizes future development options. Some land use restrictions would apply to prevent activities that could damage or weaken the cap.

Comparison of Remedial Alternatives for the Former Process Area

A	B	C	D	E	BALANCING CRITERIA *(alternatives are ranked by comparing them to each other)*
⇩	❍	❍	❍	◗ to ●	**Long-Term Effectiveness and Permanence** The alternatives are ranked according to their levels of long-term effectiveness and permanence. Alt. E's level of effectiveness and permanence depends upon the type of cap implemented. For example, a multi-layer cover system is likely more effective than a permeable cover system which could potentially allow for future re-contamination of clean fill material. Alt. A would achieve no long-term effectiveness or permanence.
⇩ 0	◗ 4	● 88	● 88	❍ 0	**Reduction of Toxicity, Mobility, and Volume *(Numbers given as a % of total contaminant mass destroyed. The total mass is taken as the sum of the contaminant mass in the Soil OU.)*** The alternatives are ranked according to their reduction of these three factors. Alts. C and D would achieve the greatest reduction because volume and mobility would be reduced and contaminants would be destroyed. Alt. B is rated lower because fewer contaminants would be destroyed. Alt. E rates lower still, with a high reduction of mobility but no contaminant destruction. Alt. A would achieve no reduction.
⇩	◗	◗	❍	●	**Short-Term Effectiveness** The alternatives are ranked according to their short-term effectiveness. Alts. B, C, D, and E would provide immediate effectiveness upon completion of construction. Alt. E is rated highest, with short construction time and little disturbance of contaminated soil. Onsite activities for Alts. B and C would require removal only and would have a higher short-term effectiveness than Alt. D which would additionally require onsite treatment. Alt. A would achieve no short-term effectiveness.
●	◗	◗	❍	◗	**Implementability** The alternatives are ranked according to their ease of implementability. Alt. A will be the least difficult to implement. Alts. B and C would be more difficult to implement, requiring removal of the contaminated soil, offsite transport, and monitoring. Alt. E would be of similar difficulty, with cover construction, monitoring, and O&M required. Alt. D would be the most difficult alternative to implement, requiring setup of an onsite treatment system, handling of by-product wastes, monitoring, and O&M.
● $0	⇩ $60.2	⇩ $143.0	⇩ $21.0	◗ to ● $2.4 to $4.0	**Cost** The estimated total present worth cost for each alternative is shown (in $millions) and includes capital and O&M costs.

KEY:
● = excellent
◗ = good
❍ = fair
⇩ = poor

REMEDIAL ALTERNATIVES
ALT. A: No Action
ALT. B: Removal & Treatment, Offsite Disposal & Thermal, Offsite Landfill with Incineration of 25% of Soil Volume
ALT. C: Treatment, Thermal, Offsite Incineration
ALT. D: Treatment, Physical/Chemical Onsite Dehalogenation
ALT. E: Containment, Capping

The alternatives for **the well CW01 area** were compared with each other as shown in the table to the right.

EPA's preferred alternative, Alternative E, is to remove contaminated soil from the area and place it in the former process area, beneath the cap.

The contaminants present in this area of the property are localized and do not appear to be widespread. Therefore, the contaminated soil can easily be excavated, moved to the former process area, and replaced with uncontaminated soil. As the soil is excavated, sampling will be required to ensure that all the contaminated soil is removed and future exposure to contaminants will not occur.

This preferred alternative is protective for residential land use and imposes the minimum restrictions; commercial or recreational land use could also be implemented. The quantity of soil removed and consolidated in the former process area is relatively small, and would not add significantly to the height of the soil in the former process area.

Comparison of Remedial Alternatives for the Well CW01 Area

A	B	C	D	E	BALANCING CRITERIA *(alternatives are ranked by comparing them to each other)*
⇩	●	●	●	●	**Long-Term Effectiveness and Permanence** The alternatives are ranked according to their levels of long-term effectiveness and permanence. Alts. B, C, D, and E would provide the same high levels because all of the contaminated soil above the cleanup criteria would be removed. Alt. A would achieve no long-term effectiveness or permanence.
⇩ 0	◗ 0	● 0.005	● 0.005	◗ 0	**Reduction of Toxicity, Mobility, and Volume** ***(Numbers given as a percentage of total contaminant mass destroyed. The total mass is taken as the sum of the contaminant mass in the Soil OU.)*** The alternatives are ranked according to their reduction of these three factors. Alts. C and D would provide the greatest reduction because volume and mobility would be reduced and contaminants would be destroyed. Alts. B and E are rated lower, with a high level of reduction of mobility but no contaminant destruction. Alt. A would achieve no reduction.
⇩	◗	◗	❍	◗	**Short-Term Effectiveness** The alternatives are ranked according to their short-term effectiveness. Alts. B, C, D, and E would provide immediate effectiveness upon completion of construction. Onsite activities for Alts. B, C, and E would require removal only and would have a higher short-term effectiveness than Alt. D, which would additionally require onsite treatment. Alt. A would achieve no short-term effectiveness.
●	◗	◗	❍	◗	**Implementability** The alternatives are ranked according to their ease of implementability. Alt. A would be easiest to implement. Alts. B and C would be more difficult to implement, requiring removal of the contaminated soils, offsite transport, and monitoring. Alt. E would be of similar difficulty, with cover construction, monitoring, and O&M required. Alt. D would be the most difficult alternative to implement, requiring setup of an onsite treatment system, handling of by-product wastes, monitoring, and O&M.
● $0	◗ $2.8	⇩ $4.9	◗ $0.9	● $0.2	**Cost** The estimated total present worth cost for each alternative is shown (in $millions) and includes capital and O&M costs.

KEY:	*REMEDIAL ALTERNATIVES*
● = excellent	**ALT. A: No Action**
◗ = good	**ALT. B: Removal, Offsite Disposal, Offsite Landfill**
❍ = fair	**ALT. C: Treatment, Thermal, Offsite Incineration**
⇩ = poor	**ALT. D: Treatment, Physical/Chemical, Onsite Dehalogenation**
	ALT. E: Removal, Onsite Consolidation, Onsite Placement

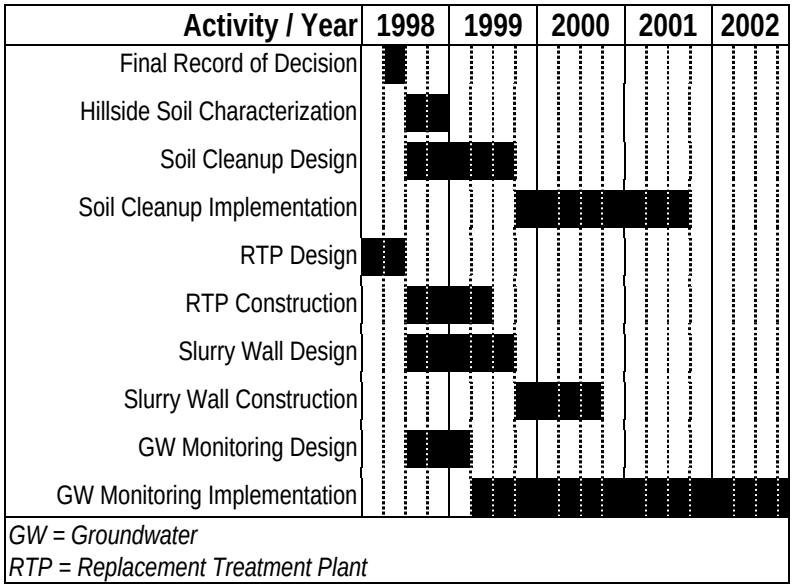
Synopsis of the Overall Final Remediation of the Wyckoff Property

The final remediation for the Wyckoff property, including the final actions for the 1st component of the Groundwater Operable unit that was originally addressed in the Interim ROD, will consist of the following activities:

- Cap the contaminated soil in the "flat" area of the property (i.e., the former log storage / peeler area and the former process area).
- Excavate contaminated soil from a small area on the hillside in the southern portion of the property (i.e., the well CW01 area), and place the soil beneath the cap in the former process area.
- Implement institutional controls to preclude the installation of drinking water wells in selected areas of the property and prevent development or activities that could damage or weaken the cap.
- Identify the nature and extent of any additional soil contamination in the hillside portion of the property.
- Encircle the former process area with a subsurface slurry wall.
- Construct a replacement groundwater treatment plant.
- Monitor groundwater in the future to confirm that contaminants will not cause unacceptable risks and to determine whether further action is needed.

The schedule for implementing these actions is shown in the figure below. The estimated net present worth for implementing these actions ranges between approximately $64.2 and $65.8 million. Of this amount, $57.2 million is associated with implementation of the remedial actions for the 1st component of the Groundwater Operable Unit that were specified in the Interim ROD.

SCHEDULE OF REMEDIATION ACTIVITIES THROUGH 2002



Statutory Findings

EPA believes that the **preferred alternative** provides the best balance of trade-offs among the alternatives with respect to the nine evaluation criteria described earlier, while complying with the requirements of the Superfund law. The preferred alternative achieves the following:

- it protects human health and the environment;
- it complies with applicable or relevant and appropriate requirements under federal and state environmental laws;
- it is cost-effective;
- and it uses permanent solutions to the maximum extent practicable.

Next Steps

After consideration of all the comments received, EPA will issue its final decision on the actions to be taken at the Wyckoff Soil and Groundwater Operable Units in the **Final ROD**. EPA will also respond in writing to all comments submitted during the comment period in a document called a **Responsiveness Summary**. The Responsiveness Summary will attached to the Final ROD, which will be available for public review at the locations identified in *For More Information* on page 22.

Abbreviations and Acronyms

ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
HDPE	high-density polyethylene
O&M	operation(s) and maintenance
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PSR	Pacific Sound Resources
RI	Remedial Investigation
ROD	Record of Decision

Definitions

Applicable or Relevant and Appropriate Requirements (ARARs): Federal and state environmental and facility siting laws and promulgated regulations that must be met or waived before cleanup of a contaminated site can be considered complete.

Cap, capping: Construction of an engineered cover system over contaminated soil and groundwater.

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), designed to respond to releases of hazardous substances and contaminants into the environment.

Creosote: Used to treat and preserve wood products, creosote is a blend of various coal tar distillates that may contain up to 90 percent polynuclear aromatic hydrocarbons (PAHs) mixed with other hydrocarbons.

Dioxins and Furans: A group of chemicals that are found as by-products of many industrial processes including chemical manufacturing.

Exposure Pathway: A pathway or a mechanism by which a person, a population, or an ecological resource is exposed to contaminants at or migrating from a site.

Feasibility Study: A study that identifies and analyzes cleanup options for Superfund sites.

Institutional Controls: Non-engineered measures such as deed restrictions (legal land use and transaction restrictions) that preclude land uses or activities (such as installing drinking water wells or constructing basements in residences) in order to prevent possible exposure to contaminants at a site.

Operable Unit: A subdivision of a Superfund site.

Pentachlorophenol: A chemical used in the wood treatment and preservation processes. Technical-grade pentachlorophenol contains 85 to 95 percent pentachlorophenol; the remainder is a mix of other chemicals and about 0.1 percent dioxins and furans.

Polynuclear aromatic hydrocarbons (PAHs): A group of chemicals that are prominent in smoke, soot, and exhaust emissions, and which are found in high concentrations in creosote-based wood preservatives.

Preferred Alternative: Of the alternatives evaluated in the Feasibility Study, this is the alternative that EPA believes will be most effective in dealing with the contamination at a site.

Receptor: A person or an ecological resource that is potentially or actually impacted by contaminants at or migrating from a site.

Record of Decision (ROD): A formal, legal document that identifies and explains the remedial action for a site.

Remedial Investigation: An investigation conducted to determine the nature and extent of contamination at a site and to obtain information needed to identify, evaluate, and select cleanup actions.

Responsiveness Summary: EPA's written responses to all comments received on the proposed plan during the public comment period. The Responsiveness Summary is attached to the Final Record of Decision.

Sediments: The deposits on the bottom of a body of water such as a harbor, a lake, a river, or an ocean.

Slurry Wall: A subsurface physical barrier (composed of bentonite, clay, and soil) that is intended to prevent the migration of contaminants.

Superfund: see CERCLA.

For More Information

The information in this proposed plan summarizes extensive investigations and studies that have been conducted at the Wyckoff Soil and Groundwater Operable Units. Greater detail is provided in the following documents:

- Remedial Investigation Report for the Wyckoff Soil and Groundwater Operable Units (this report includes the Baseline Human Health and Ecological Risk Assessments), June 13, 1997
- Feasibility Study Report for the Wyckoff Soil and Groundwater Operable Units, October 17, 1997

These reports and additional project-related information are available at the Information Repository described in the sidebar to the right. These documents can also be downloaded from EPA Region 10's Internet web site at:

http://epainotes1.rtpnc.epa.gov:7777/r10/cleanup.nsf/webpage/wyckoff-eagle+harbor

If you have questions about the Wyckoff Soil and Groundwater Operable Units, contact **Peter Rubenstein**, EPA Project Manager, at **206-553-1067.**

If you have questions about the East and West Harbor Operable Units, contact **Ellen Hale,** EPA Project Manager, at **206-553-1215.**

If you need more information about the Wyckoff/Eagle Harbor Superfund Site, call: **Nancy Wilson,** EPA Community Relations Coordinator, at **206-553-1237.**

For those with impaired hearing or speech, please contact EPA's telecommunications device for the hearing-impaired at **206-553-1698.** To ensure effective communication with everyone, additional services can be made available to disabled persons by contacting one of the EPA staff listed on this page or by calling (toll free) **1-800-424-4372.**

The Information Repository and the Administrative Record

The **Administrative Record** is a file containing all the information used by EPA to make its decisions on cleanup actions. A copy of the Administrative Record is available for public review and normally is housed in a location near the site, known as the **Information Repository**. For many years, the Bainbridge Island Public Library was the Information Repository for the Wyckoff/Eagle Harbor Superfund Site; however, because of limited space at the library, EPA can only keep the most current documents and plans at the library, not the entire Administrative Record.

The **Bainbridge Island Public Library** is located at **1270 Madison Avenue North**. If the library does not have the document you need, please request assistance from Nancy Wilson, EPA Community Relations Coordinator, at **206-553-1237**.

The Administrative Record can also be reviewed at EPA Region 10: **EPA Records Center, 7th Floor, 1200 Sixth Avenue, Seattle.** To make an appointment to review the Administrative Record, call **206-553-4494** or Nancy Wilson, EPA Community Relations Coordinator, at **206-553-1237**.

The tables on this page cross-reference the alternatives described in this proposed plan to those evaluated in the Feasibility Study Report for the Wyckoff Soil and Groundwater Operable Units (October 17, 1997). The alternatives that make up EPA's preferred alternative for the Wyckoff Operable Units are shaded in the tables.

Alternatives for the Former Log Storage/Peeler Area

Proposed Plan Alternative	*Feasibility Study Alternative(s)*
ALT. A: No Action	ALT. 1: No Action
ALT. B: Removal, Offsite Disposal, Offsite Landfill	ALT. 2: Removal, Offsite Disposal, Offsite Landfill (Commercial Land Use) ALT. 7: Removal, Offsite Disposal, Offsite Landfill (Residential Land Use)
ALT. C: Treatment, Thermal, Offsite Incineration	ALT. 3: Treatment, Thermal, Offsite Incineration (Commercial Land Use) ALT. 8: Treatment, Thermal, Offsite Incineration (Residential Land Use)
ALT. D: Treatment, Physical/Chemical, Onsite Dehalogenation	ALT. 4: Treatment, Physical/Chemical, Onsite Dehalogenation (Commercial Land Use) ALT. 9: Treatment, Physical/Chemical, Onsite Dehalogenation (Residential Land Use)
ALT. E: Removal, Onsite Consolidation	ALT. 5: Removal, Onsite Consolidation (Commercial Land Use) ALT. 10: Removal, Onsite Consolidation (Residential Land Use)
ALT. F: Containment, Capping, Multi-Layer Cover System with Low-Permeability Barrier Layer	ALT. 6: Containment, Capping, Multi-Layer Cover System with Low-Permeability Barrier Layer

Alternatives for the Former Process Area

Proposed Plan Alternative	*Feasibility Study Alternative(s)*
ALT. A: No Action	ALT. 1: No Action
ALT. B: Removal & Treatment, Offsite Disposal & Thermal, Offsite Landfill with Incineration of 25% of Soil Volume	ALT. 2: Removal & Treatment, Offsite Disposal & Thermal, Offsite Landfill with Incineration of 25% of Soil Volume
ALT. C: Treatment, Thermal, Offsite Incineration	ALT. 3: Treatment, Thermal, Offsite Incineration
ALT. D: Treatment, Physical/Chemical, Onsite Dehalogenation	ALT. 4: Treatment, Physical/Chemical Onsite Dehalogenation
ALT. E: Containment, Capping	ALT. 5: Containment, Capping, Asphalt-Concrete Cover ALT. 6: Containment, Capping, High-Permeability Fill Cover (Comm. Land Use) ALT. 7: Containment, Capping, High-Permeability Fill Cover (Rec. Land Use) ALT. 8: Containment, Capping, Multi-Layer Cover System

Alternatives for the Well CW01 Area

Proposed Plan Alternative	*Feasibility Study Alternative*
ALT. A: No Action	ALT. 1: No Action
ALT. B: Removal, Offsite Disposal, Offsite Landfill	ALT. 2: Removal, Offsite Disposal, Offsite Landfill
ALT. C: Treatment, Thermal, Offsite Incineration	ALT. 3: Treatment, Thermal, Offsite Incineration
ALT. D: Treatment, Physical/Chemical, Onsite Dehalogenation	ALT. 4: Treatment, Physical/Chemical, Onsite Dehalogenation
ALT. E: Removal, Onsite Consolidation	ALT. 5: Removal, Onsite Consolidation